

A PRELIMINARY NOTE ON THE ACACIA LEGUME AS A LATERAL ORGAN.

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(Six Text-figures.)

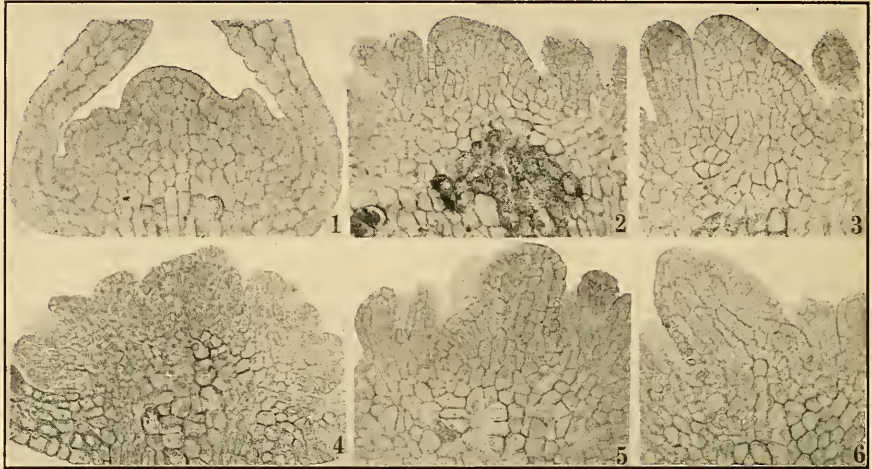
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The classical interpretation of the carpel as a fertile modified leaf has been adversely criticized. Generally the criticisms contain the statement that the carpel (or one of the carpels) or the gynaecium is terminal, the whole of the residual tissues of the floral apex giving rise to the primordium of the (or a) carpel, leaving no sign of a suppressed apex. It is significant that in the papers I will refer to shortly, propounding four different theories, there are no figures showing the cell-details of the primordial tissues of the floral apex in support of the contentions made. A study of these tissues in *Acacia suaveolens* and *A. longifolia* has convinced me that in these species the carpel (legume) is lateral in origin, the floral apex remaining suppressed. A full presentation and discussion of the evidence cannot be issued before May of next year, owing to the long vacation, so the essence of this important matter is presented in this preliminary note.

During the formation of sepal and petal primordia the floral axis is conical in shape. After this the upper part of the axis broadens into a disc-like structure leaving the apex as a central dome. The broadened region is the place of origin of the stamens (Fig. 1). The carpel begins as a lateral protuberance on the apical dome which is so small that the primordium occupies nearly half of the surface as seen in longitudinal section (Figs. 2, 3, 4). The carpel soon overtops and pushes aside the relatively minute residue of the apex whose regularly arranged cells on one side of the central structure in Figures 2-6 contrast with the large and differently arranged cells of the primordium or base of the young carpel on the other side. The large-celled pith comes to extend between the pro-cambium of the carpel and the suppressed apex (Fig. 6). The confined space between the stamens ultimately forces the carpel (legume) into an erect position which almost obliterates the minute, laterally displaced, suppressed apex. In all median sections examined (about 12 each of domed apex and lateral primordium in both species) the number of epidermal and hypodermal cells of the suppressed apex was just more than half that of those cells in the domed apex. The figures are explained in the legend.

Thompson (1931, pp. 43, etc., and cf. Fig. 63) describes the legume as terminal, and in the end interprets it as a phylloclade. (See also 1932.) Saunders (1929, pp. 225-7, cf. especially Figs. 1-3) regards the legume as terminal, "arising through the continued activity of cells which are actually apical", and refers to *A. suaveolens* and *longifolia*. Grégoire (1931), after discussing primordia (without giving cellular detail), concludes that, in general, the whole of the central part of

the floral axis becomes, or could become, a carpel. The evidence given here of the beginning of the carpel disproves these statements of terminality as far as these legumes are concerned. Thomas's (1934, p. 188) scheme for the evolution of the follicle (which he applies to the legume) does not agree with the ontogeny of the legume as given here, for the ovules are well known to be borne on the "margins" of the legume which is here shown as an organ lateral to the suppressed apex of the flower.



Text-figures 1-3.—L.S., young flowers of *Acacia suaveolens*, $\times 200$ (approx.). 1, from insertion of petals upwards, showing domed apex and stamen primordia; 2 and 3, carpel beginning at the left of the apex by divisions and enlargements in the hypodermis there, suppressed apex to the right with just more than half the number of epidermal cells as in the domed apex.

Text-figures 4-6.—L.S., young flowers of *Acacia longifolia*, $\times 200$ (approx.). 4, from insertion of the petals upwards, showing the carpel beginning at the right of the domed apex by divisions and enlargements in the hypodermis there; 5, section down the incipient groove of the carpel, one face is included just out of focus. Suppressed apex on the left; 6, section includes one face of the groove to which it is parallel. Carpel procambium to the left, suppressed apex to the right, extension of pith cells between them, hypodermis of apex and carpel now realigned, section slightly oblique to length of the groove.

Extended evidence and discussion will be given in the paper being prepared. This evidence is of a type necessary to such discussions, but is not presented by those mentioned above when making generalizations. It is hoped that botanists will give more attention to cellular details of tissues as a basis for morphological conclusions (or even speculations).

Literature Cited.

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